Name……………………………………….

**Year 10 Advanced Maths**

**DEDUCTIVE GEOMETRY TEST**

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| **Criterion A**: **Knowledge and Understanding** | | | | |
| Achievement Level Descriptors | **IBMYP Descriptor** | Examples from the ***Deductive Geometry Test*** | **Level** | |
| * **Consistently** makes **appropriate** deductions when solving **challenging** problems in a **variety** of contexts including **unfamiliar** situations. | * Successfully completed up to and including **Question 7 and Question 8**. | ❽ ⑧  ❼ ⑦ | 8 to 7 |
| * **Generally** makes **appropriate** deductions when solving **challenging** problems in a **variety** of **familiar** contexts. | * Successfully completed up to and including **Question 5 and Question 6**. | ❻ ⑥  ❺ ⑤ | 6 to 5 |
| * **Sometimes** makes **appropriate** deductions when solving **simple** problems **familiar** contexts. | * Successfully completed up to and including **Question 3 and Question 4**. | ❹ ④  ❸ ③ | 4 to 3 |
| * **Attempts** to make deductions when solving **simple and more-complex** problems in **familiar** contexts. | * Successfully completed **Question 1 and Question 2.** | ❷ ②  ❶ ① | 2 to 1 |
| * Has not reached a standard described by any of the above descriptors. | * Has not successfully completed **Question 1 and Question 2.** |  | 0 |

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| **Criterion C**: **Communication in Mathematics** | | | | |
| Achievement Level Descriptors | **IBMYP Descriptor** | Examples from the ***Deductive Geometry Test*** | | **Level** |
| * **Good** use of mathematical language **and** forms of mathematical representation. * The lines of reasoning are **concise**, **logical** and **complete**. * **Effectively** moves between different forms of representation. | * **Reasons** for **all** your answersare **consistently** listed. | □ | 6 to 5 |
| * Pictures are **consistently** **drawn neatly** and appropriately **labelled**. | □ |
| * **Consistent** use of **correct geometry terms.** | □ |
| * **Sufficient** use of mathematical language **and** forms of mathematical representation. * The lines of reasoning are **clear** though not always **logical** or **complete**. * Moves between different forms of representation **with some success**. | * Reasons for **most** of your answers are listed. | □ | 4  to  3 |
| * Pictures are **mostly** appropriately **labelled**. | □ |
| * **Most** **geometry terms** used are **correct.** | □ |
| * **Basic** use of mathematical language **and/or** forms of mathematical representation. * The lines of reasoning are **difficult to follow**. | * **Some** reasons for your answers are listed. | □ | 2 to 1 |
| * Pictures are **rarely labelled**. | □ |
| * **Limited** use of appropriate **geometry terms.** | □ |
| * Has not reached a standard described by any of the above descriptors. | * Has not attempted to give any reasons in your working out. * Has not attempted to draw any picture to show your working out. | | 0 |

1. Fill the gap with the appropriate word: ***alternate, bisector, circumference, semicircle, segment, tangent.***
2. The perpendicular \_\_\_\_\_\_\_\_\_\_\_\_ of any chord passes through the centre of the circle.
3. The angle between a \_\_\_\_\_\_\_\_\_\_\_\_ and a radius is 90°.
4. The angle in a \_\_\_\_\_\_\_\_\_\_\_\_ is always 90°.
5. The angle subtended at the centre is twice the angle at the \_\_\_\_\_\_\_\_\_\_\_\_.
6. Angles in the same \_\_\_\_\_\_\_\_\_\_\_\_ are equal.
7. The angle between a tangent and its chord is equal to the angle in the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_.
8. Find the value of the x and give a brief reason:

*x*

100°

120°

|  |  |  |  |
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| 1. \\Ntserver\MISC WORK\ HARPER COLLINS\000_GCSE MATHS HIGHER\0976_Final Archive\Artwork to convert\JPGs\0976ch07f004.jpg   50– *p*  2*p* – 10  *x* | 50°  *x* | |  |
| 1. \\Ntserver\MISC WORK\ HARPER COLLINS\000_GCSE MATHS HIGHER\0976_Final Archive\Artwork to convert\JPGs\0976ch07f007.jpg |  | |  |
| 1. In the figure, TA is a tangent to the circle at T and BC is a diameter produced   O  62°  D  T  C  A  B  *x*  to meet at A. If ∠BTD = 62°, find *x*. | | | |
| C  G  *y*  5  *x*  F  B  A  10  a) Show that ΔABC and ΔGFC are similar.  b) Show that *y* = 2*x* | | c) The volume of a cone is given by  An empty conical tank of base radius 5m and height 10m is held up so its pointed end faces downwards. If it is filled with water until the radius of the surface of the water is *x* metres as shown below. Find the volume of water in the tank in terms of x.Cone.jpg | |
| 1. A semi-circle has a base diameter AB. Point C is placed somewhere on the semi-circle (not on A or B) and a line is drawn from C to meet line AB at point P so that APC = 90o.   C  B  A  P  It is believed that ΔACP is similar to ΔPBC, which we will prove now. Let CAP be *a*o.  Find in terms of a, giving reasons:  a) ACB  b) ABC | | c) CPB  d) PCB  e) PCA  Explain why ΔACP is similar to ΔPBC  If PB = 10, BC = 14 and AC = 28, find CP. | |

1. Two tangents meet the circle, centre O, at points A and B and when extended meet at point P. Create lines OP, OA and OB on the diagram below.

B

A

P

Assuming the *tangent-radius* theorem is true (and without using the *tangents from an external point* theorem), prove the two triangles are congruent.

What does this say about lines AP and BP?

A

F

E

B

D

C

1. On the diagram on the right, ABC is a straight line. FB bisects angle ABE. Prove that FD bisects angle CDE.

**

1. ABC is a triangle. D is the midpoint of AB, E is the midpoint of AC and F is the midpoint of BC.

DG ⊥ AB, EG ⊥AC and FG ⊥ BC.

1. Prove that ∠GAD = ∠GBD.
2. Prove that ∠GAE = ∠GCE.
3. Prove that ∠GBF = ∠GCF.
4. What does this mean about AG, BG and CG?
5. A circle centred at G is drawn through A. What other points must it pass through?